

Submission by



to the

Ministry of Business, Innovation & Employment (MBIE)

on the

A vision for hydrogen in New Zealand: Green paper

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Tina Schirr
BusinessNZ
Energy Council
PO Box 1925
Wellington

A VISION FOR HYDROGEN IN NEW ZEALAND: GREEN PAPER SUBMISSION BY BUSINESSNZ ENERGY COUNCIL¹

1. INTRODUCTION

- 1.1 The BusinessNZ Energy Council (BEC) welcomes the opportunity to provide feedback on the '*A vision for hydrogen in New Zealand: Green paper*' (referred to as 'the paper').
- 1.2 The BEC supports the Government's goal of promoting a more productive, sustainable and inclusive economy and welcomes engagement on the challenges and opportunities involved in building a hydrogen economy in New Zealand. The Ministry of Business, Innovation & Employment (MBIE) is to be congratulated on its development in conjunction with ARUP, of a robust and well-argued green paper.
- 1.3 The BEC largely agrees with the identified challenges and opportunities. The paper recognises a bundle of complex issues that must be resolved in using hydrogen to support a successful transition to a low carbon economy.
- 1.4 Looking ahead, the BEC supports the development of a hydrogen strategy but this needs to be a joined-up component of an overarching renewable energy strategy.

2. SUMMARY OF RECOMMENDATIONS

The role of government should be:

- a) *to support policy frameworks that encourage the use of low-carbon fuels, including but not limited to hydrogen;*
- b) *to remove red tape, such as barriers to commercialisation, including the production, transport and use of hydrogen;*
- c) *to invest in research into renewable fuels to identify the best prospects for New Zealand;*
- d) *to facilitate cross-sector and international cooperation; and*
- e) *to help shape export opportunities for NZ companies*

3. CHALLENGES, OPPORTUNITIES, AND THE GOVERNMENT'S ROLE

- 3.1 Overall, the right opportunities and challenges have been laid out in the paper. The following is intended to add or reinforce a few points made there as well as to provide some further guidance.
- 3.2 The BEC agrees that hydrogen could play a role in reducing carbon emissions in New Zealand. The potential of hydrogen as a sustainable fuel alternative has been discussed for decades. However, for the first time, we are seeing a globally growing interest in the development of hydrogen. Private investors and governments around the world are investing in hydrogen research and projects.

"The key differences since the last hydrogen "hype cycle" in the late 2000s are a series of coexisting technological advances together with environmental and political drivers. Fuel cell and electrolysis are technologies that are maturing."²
- 3.3 New Zealand is a technology-taker and cannot, therefore, simply ignore overseas developments. Given New Zealand's abundance of renewable energy sources, the country has a strategic advantage when it comes to producing and exporting green hydrogen. This point is supported by the challenges faced in moving to 100% renewable electricity and net carbon zero.
- 3.4 Currently, the most common forms of hydrogen globally are produced from fossil fuels and industrial processes (brown and grey hydrogen), all of which can be decarbonised with hydrogen produced from renewables (green hydrogen). Given New Zealand's abundance of renewables, the production of green hydrogen makes long-term sense. Today, green hydrogen production costs are challenging. The economics of green hydrogen will, though, further improve as the price for electrolysis and fuel cells falls. Key challenges are the business case and scalability, both of which depend on the answer to the question of how to overcome the additional costs of producing green.
- 3.5 International markets for hydrogen can help to overcome obstacles such as scalability. Japan and South Korea have put in place bold strategies which include the importation of hydrogen. Germany and Australia will release their hydrogen strategy by the end of the year. Besides Japan and South Korea, Germany has expressed interest in collaborating with New Zealand on green hydrogen. In September, Germany's Chancellor, Angela Merkel,

¹ Background information on BusinessNZ Energy Council (BEC) is attached as Appendix One.

² WEC Insight Briefing (September 2019): Hydrogen Economy – Hype or Hope? Page 6 [<https://www.worldenergy.org/assets/downloads/WEInnovation-Insights-Brief-New-Hydrogen-Economy-Hype-or-Hope.pdf>]

agreed to support a €54 billion package of climate policies aimed at getting Germany back on track to meet its goal of reducing greenhouse gas emissions by 2030.³ As part of the “Energiewende” (Germany’s transition to non-nuclear, sustainable power sources), the Ministry of Education and Research announced an investment of €300 million in research on green hydrogen by 2023 (€180 million have already been allocated for the coming years).⁴ In a meeting, facilitated by BEC and the Konrad Adenauer Foundation, Dr Joachim Lang, the Director General of the Federation of German Industry (BDI), asked how Germany and New Zealand can work together in developing hydrogen. He said that Germany would have a strong interest in importing green hydrogen from New Zealand, showing a willingness to pay the additional cost of producing green, instead of brown or grey, hydrogen. This is a great opportunity for New Zealand and Germany to identify potential areas of collaboration and the BEC would be happy to facilitate its further development.

3.6 However, exporting from New Zealand is not without challenges, such as the long-distance transportation of hydrogen. Hydrogen as a gas has a very low density and takes up space. A lot of the discussion is therefore around transporting it in its liquid form, which takes up less space.

3.7 New Zealand’s green hydrogen will also have to compete with countries where green hydrogen might be produced more cheaply, such as Australia and those closer to markets. As stated in the 2nd paragraph on page 25 of the paper:

“Production costs of green hydrogen are highly dependent on factors such as electricity costs and taxes, grid fees and the capacity utilisation rates of electrolysers.”

Besides scalability, additional costs such as grid fees will influence the ability of New Zealand businesses to compete with countries like Australia. However, the connection to the grid is an opportunity. The integration of large-scale renewables and hydrogen production into the grid is an opportunity for New Zealand to help solve the problem of renewables’ intermittency and seasonality. Grid connection cost structures need to be addressed in connection with this technology.

3.8 The degree to which hydrogen can be deployed depends on cross-sector and international cooperation. In order to make green hydrogen economically viable, it is important that the role of hydrogen is looked at as a whole system transition solution. Hydrogen can be used for electricity and heat. It can synthesise any kind of liquid or gaseous fuel which provides an alternative to fossil fuels. To give only a few examples, hydrogen can be used for energy storage for residential, commercial and industrial use, to decarbonise industrial processes for which electrification is technically complicated or expensive (for example steel), as a clean fuel for mobility purposes, as well as for producing green fertilisers. Fertilisers are produced using ammonia, which is produced using hydrogen. If you clean your production of hydrogen, you clean your fertilisers. It is important to understand the needs of businesses wanting to produce or use green hydrogen onsite.

3.9 An underlying barrier to the deployment of hydrogen is the lack of recognition of its production, transportation and use in many current regulations (for example the road transport regulations, the Gas Act, as well as health and safety regulations). This leads to regulators lacking knowledge and independent inspectors lacking expertise. How can we simplify onsite green hydrogen production? What are the things businesses need to know and how can requirements be simplified? Are there any red tape or administrative barriers which can be removed? The BEC agrees with the issue raised under the headline ‘Policy and Regulation’, 1st paragraph on page 55 of the paper:

“Hydrogen developers face hurdles where regulations and permit requirements are unclear, unfit for new purposes or inconsistent across sectors and countries. Sharing knowledge and harmonising standards is critical, including for equipment, safety and certifying emissions from different sources. Hydrogen’s complex supply chains mean Governments, companies, communities and civil society need to consult regularly.”

The government can encourage hydrogen projects by providing more clarity around the production, transportation and use of hydrogen in policies and regulations. By its nature hydrogen production carries a significant risk, falling into the “high hazards” category under existing law. While hydrogen health and safety issues arguably are similar to those associated with natural gas or petroleum, appropriate responses to the risks posed by hydrogen production may involve some unique features. A national standard for hydrogen would therefore be useful to remove some of the current uncertainty around the production, transportation and use of hydrogen.

³ CNN (September 2019): Germany unveils \$60 billion plan to fight the climate crisis [<https://edition.cnn.com/2019/09/20/economy/germany-climate-crisis-package/index.html>]

⁴ GTAI (October 2019): Germany Pledges €300 Million for Green Hydrogen Research [<https://www.prnewswire.com/news-releases/gtai-germany-pledges-300-million-for-green-hydrogen-research-300934818.html>]

- 3.10 Another barrier for the roll-out of hydrogen is the availability of technology and infrastructure. For example, transport, where New Zealand's market size might limit access to heavy trucks (left-hand-drive). The BEC agrees with MBIE's concern raised under the headline 'vehicles and hydrogen application', 1st paragraph on page 56 of the paper:

"There is limited availability of buses and heavy-duty vehicles, with long lead times (one year to 18 months) for delivery to smaller and more distant markets such as New Zealand as larger orders may be prioritised over smaller orders."

Also, refuelling infrastructure for mobility purposes is not there yet and requires bold leadership. The BEC agrees with the point raised under the headline 'Economics', 2nd paragraph on page 55 of the paper:

"The emerging FCEV market requires close value-chain synchronisation to overcome the first-mover risk of building hydrogen refuelling infrastructure. While the initial investment is relatively low, the risk is high and therefore greatly reduced if many companies invest, co-ordinated by Governments and supported by dedicated legislation and funding."

The BEC TIMES-NZ energy scenarios did not see hydrogen as an economic option for transport or industrial heat applications. However, we know from sensitivity analysis that the assumed purchase cost of hydrogen fuel-cell trucks only needs to drop by less than 5% for them to be preferable to electric trucks, and we suspect this would occur at the heavy trucking end of the spectrum (20-30 tonnes).⁵

- 3.11 Finally, the paper focuses on green hydrogen. However, blue hydrogen (carbon fuel derived with Carbon Capture and Storage – CCS) offers an opportunity to continue on a business as (almost) usual basis, while contributing to decarbonisation efforts. CCS can reduce emissions by up to 90% and provides a medium-term solution in transitioning to renewable electrification. CCS also allows oil and gas to play a role in the transition, supporting the decarbonisation of production. Currently, there is no specific legal framework supporting the use of CCS in New Zealand. A strategy should include the use of blue hydrogen as a means of decarbonising businesses in the interim.

⁵ The BEC TIMES-NZ model assumed this for hydrogen produced through electrolysis (green hydrogen).

Appendix One - Background information on BusinessNZ Energy Council (BEC)

The [BusinessNZ Energy Council \(BEC\)](#) is a group of New Zealand's peak energy sector organisations taking a leading role in creating a sustainable energy future. BEC is a division of BusinessNZ, New Zealand's largest business advocacy group. BEC is a member of the [World Energy Council \(WEC\)](#). BEC members are a cross-section of leading energy sector businesses, government and research organisations. Together with its members BEC is shaping the energy agenda for New Zealand.

Our vision is to support New Zealand's economic wellbeing through the active promotion of the sustainable development and use of energy, domestically and globally. With that goal in mind, BEC is shaping the debate through leadership, influence and advocacy.

[BusinessNZ](#) is New Zealand's largest business advocacy body, representing:

- Regional business groups [EMA](#), [Business Central](#), [Canterbury Employers' Chamber of Commerce](#), and [Employers Otago Southland](#)
- [Major Companies Group](#) of New Zealand's largest businesses
- [Gold Group](#) of medium sized businesses
- [Affiliated Industries Group](#) of national industry associations
- [ExportNZ](#) representing New Zealand exporting enterprises
- [ManufacturingNZ](#) representing New Zealand manufacturing enterprises
- [Sustainable Business Council](#) of enterprises leading sustainable business practice
- [BusinessNZ Energy Council](#) of enterprises leading sustainable energy production and use
- [Buy NZ Made](#) representing producers, retailers and consumers of New Zealand-made goods

BusinessNZ is able to tap into the views of over 76,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy.

In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation ([ILO](#)), the International Organisation of Employers ([IOE](#)) and the Business and Industry Advisory Council ([BIAC](#)) to the Organisation for Economic Cooperation and Development ([OECD](#)).



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